

1. Find the inverse of the function below. Then, evaluate the inverse at  $x = 7$  and choose the interval that  $f^{-1}(7)$  belongs to.

$$f(x) = \ln(x - 5) + 3$$

- A.  $f^{-1}(7) \in [162751.79, 162762.79]$
  - B.  $f^{-1}(7) \in [45.6, 50.6]$
  - C.  $f^{-1}(7) \in [55.6, 61.6]$
  - D.  $f^{-1}(7) \in [9.39, 11.39]$
  - E.  $f^{-1}(7) \in [22030.47, 22034.47]$
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2. Multiply the following functions, then choose the domain of the resulting function from the list below.

$$f(x) = \frac{4}{4x - 19} \text{ and } g(x) = \frac{2}{6x - 29}$$

- A. The domain is all Real numbers greater than or equal to  $x = a$ , where  $a \in [-8.67, -3.67]$
  - B. The domain is all Real numbers less than or equal to  $x = a$ , where  $a \in [2, 8]$
  - C. The domain is all Real numbers except  $x = a$ , where  $a \in [-9.2, -2.2]$
  - D. The domain is all Real numbers except  $x = a$  and  $x = b$ , where  $a \in [-0.25, 8.75]$  and  $b \in [2.83, 6.83]$
  - E. The domain is all Real numbers.
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3. Find the inverse of the function below (if it exists). Then, evaluate the inverse at  $x = -11$  and choose the interval that  $f^{-1}(-11)$  belongs to.

$$f(x) = \sqrt[3]{2x - 3}$$

- A.  $f^{-1}(-11) \in [661.2, 664.3]$
- B.  $f^{-1}(-11) \in [-666.5, -663.8]$

- C.  $f^{-1}(-11) \in [-668.5, -665]$
  - D.  $f^{-1}(-11) \in [666.6, 669.2]$
  - E. The function is not invertible for all Real numbers.
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4. Subtract the following functions, then choose the domain of the resulting function from the list below.

$$f(x) = \frac{3}{4x - 17} \text{ and } g(x) = \frac{5}{5x + 34}$$

- A. The domain is all Real numbers greater than or equal to  $x = a$ , where  $a \in [0.67, 10.67]$
  - B. The domain is all Real numbers less than or equal to  $x = a$ , where  $a \in [0.5, 7.5]$
  - C. The domain is all Real numbers except  $x = a$ , where  $a \in [-6.6, -1.6]$
  - D. The domain is all Real numbers except  $x = a$  and  $x = b$ , where  $a \in [2.25, 11.25]$  and  $b \in [-9.8, -4.8]$
  - E. The domain is all Real numbers.
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5. Choose the interval below that  $f$  composed with  $g$  at  $x = -1$  is in.

$$f(x) = 4x^3 - 2x^2 - 3x + 1 \text{ and } g(x) = -3x^3 - 4x^2 + 4x + 4$$

- A.  $(f \circ g)(-1) \in [2.9, 5.2]$
  - B.  $(f \circ g)(-1) \in [-13.3, -11.7]$
  - C.  $(f \circ g)(-1) \in [-9.3, -5.2]$
  - D.  $(f \circ g)(-1) \in [-3.7, 1.5]$
  - E. It is not possible to compose the two functions.
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6. Choose the interval below that  $f$  composed with  $g$  at  $x = 1$  is in.

$$f(x) = 4x^3 - 3x^2 - 4x \text{ and } g(x) = x^3 - 2x^2 - x$$

- A.  $(f \circ g)(1) \in [-37, -33.6]$
  - B.  $(f \circ g)(1) \in [-43.1, -38.7]$
  - C.  $(f \circ g)(1) \in [-35.4, -32.2]$
  - D.  $(f \circ g)(1) \in [-46.5, -43]$
  - E. It is not possible to compose the two functions.
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7. Determine whether the function below is 1-1.

$$f(x) = -18x^2 + 30x + 408$$

- A. No, because there is a  $y$ -value that goes to 2 different  $x$ -values.
  - B. No, because there is an  $x$ -value that goes to 2 different  $y$ -values.
  - C. No, because the domain of the function is not  $(-\infty, \infty)$ .
  - D. No, because the range of the function is not  $(-\infty, \infty)$ .
  - E. Yes, the function is 1-1.
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8. Determine whether the function below is 1-1.

$$f(x) = -18x^2 - 27x + 551$$

- A. Yes, the function is 1-1.
  - B. No, because there is an  $x$ -value that goes to 2 different  $y$ -values.
  - C. No, because there is a  $y$ -value that goes to 2 different  $x$ -values.
  - D. No, because the range of the function is not  $(-\infty, \infty)$ .
  - E. No, because the domain of the function is not  $(-\infty, \infty)$ .
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9. Find the inverse of the function below. Then, evaluate the inverse at  $x = 9$  and choose the interval that  $f^{-1}(9)$  belongs to.

$$f(x) = \ln(x - 5) - 2$$

- A.  $f^{-1}(9) \in [1099.63, 1108.63]$
  - B.  $f^{-1}(9) \in [59866.14, 59873.14]$
  - C.  $f^{-1}(9) \in [51.6, 54.6]$
  - D.  $f^{-1}(9) \in [1202602.28, 1202607.28]$
  - E.  $f^{-1}(9) \in [59877.14, 59881.14]$
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10. Find the inverse of the function below (if it exists). Then, evaluate the inverse at  $x = -13$  and choose the interval that  $f^{-1}(-13)$  belongs to.

$$f(x) = \sqrt[3]{5x - 3}$$

- A.  $f^{-1}(-13) \in [439.58, 440.16]$
  - B.  $f^{-1}(-13) \in [-439.47, -438.01]$
  - C.  $f^{-1}(-13) \in [438.07, 439.06]$
  - D.  $f^{-1}(-13) \in [-441.24, -439.27]$
  - E. The function is not invertible for all Real numbers.
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